

# LEGAL LIABILITY FOR DAM FAILURES AND EMERGENCY ACTION PLANNING

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Success has many a proud parent,  
but failure is an orphan.

Lawyers will find those  
responsible for the failure.

# PREMISES

We live In a litigious society.

Sue them all.

IN THE CASE OF A CATASTROPHIC DAM FAILURE,

- EXTENSIVE LIABILITY WILL ENSUE
- ALMOST EVERYONE REMOTELY CONNECTED TO THE FACILITY WILL BE SUED
  - ARCHITECTS
  - ENGINEERS
  - DESIGNERS
  - CONTRACTORS
  - SUBCONTRACTORS
  - OWNERS
  - OPERATORS
  - INSPECTORS
  - REGULATORS
- OVERRIDING PURPOSE OF MODERN TORT LAW IS TO COMPENSATE INNOCENT VICTIMS FOR INJURIES CAUSED BY WRONGDOERS

RULES OF LAW VARY BY STATE / JURISDICTION

# **THEORIES OF RELIEF**

- **NEGLIGENCE**
- **STRICT LIABILITY**

# **STRICT LIABILITY**

## **ANCIENT ORIGINS**

- o **CODE OF HAMMURABI**

IN THE CASE OF “A HOUSE BEING SO CARELESSLY BUILT AS TO CAUSE DEATH TO THE OWNER’S SON,” THE BUILDER’S SON WAS TO BE PUT TO DEATH.

- o **OLD TESTAMENT**

“AN EYE FOR AN EYE, A TOOTH FOR A TOOTH”

**LIABILITY IS IMPOSED REGARDLESS OF FAULT**

**BASED ON ABNORMALLY DANGEROUS OR ULTRA  
HAZARDOUS ACTIVITIES**

**OFTEN USED IN DAM FAILURE LITIGATION**

# How to Prevent (Natural) Disasters

- Don't inhabit geologically unstable areas
  - Earthquakes
    - Los Angeles
    - San Francisco
    - Seattle
    - New Madrid Fault (Memphis)
  - Hurricanes
    - Gulf Coast
    - Atlantic Coast (Florida to Maine)
    - Barrier Islands
    - Hawaii (Kauai)
  - Volcanoes (Pacific Rim of Fire)
    - Seattle
    - Hawaii
    - Portland
  - Floods
    - Floodplains
    - Coastal Zone
    - Mountain Valleys
  - Landslides and Mudslides
  - Avalanches
  - Fires
- Adequate design, construction, maintenance, inspections, renovations

Prevention is the best approach

But just if

Emergency action plans may:

- Minimize the impacts;
- Mitigate the consequences;
- Facilitate recovery.



# Premises

- Infinite number of ways a facility (dam) can fail, but the consequences are finite.
- Failing to plan is planning to fail.
- Ease of preparing, testing and periodically updating an emergency action plan often outweighs the risk of not doing so.

# Three Alternatives

No plan

Inadequate plan

Failure to follow plan

# What is Negligence?

- Negligence is the failure to exercise reasonable care under the circumstances.
- Consists of four elements:
  - Duty
  - Breach
  - Causation
  - Damages

# Duty

- Failure to exercise the standard of care of a reasonable person under the circumstances
- Often based upon the reasonable foreseeability of the risk
- How would a reasonable person act in light of that risk?
- Legal duty of reasonable care is a calculus of three factors:
  - Risk of an accident occurring;
  - Magnitude of harm should the risk materialize;
  - Availability of alternatives.
- Flexible standard
  - Varies with risks, population, technology
  - The higher the risk the higher the standard of care
  - Varies with downstream development
- Extends to all those foreseeably at risk.

# Duty

- Reasonable foreseeable of risk
- Statutes
- Regulations
- Professional / industry standards

Foreseeability

# Negligence can apply to the

- Design
- Construction
- Operation
- Maintenance
- Inspection
- Repairs and modifications
- Regulation
- And now, lack of an adequate emergency action plan

**DUTY EXTENDS TO ALL THOSE  
FORESEEABLY AT RISK  
(NOT JUST THOSE IN PRIVITY OF CONTACT)**

- DOWNSTREAM DEVELOPMENT
- RESIDENTS
- RECREATIONAL USERS
- TRAVELERS
- WORKERS
- COMMERCIAL ENTERPRISES
- UTILITIES
- GOVERNMENT FACILITIES



# INSPECTORS

PREMISE: A TIMELY, COMPETENT  
INSPECTION WOULD HAVE  
DISCOVERED THE PROBLEM IN  
TIME TO PREVENT THE ENSULING  
FAILURE

- FAILURE TO INSPECT  
OR
- NEGLIGENCE IN ACTUAL INSPECTION

# **INSPECTION, MAINTENANCE, AND OPERATIONS**

- INSPECT REGULARLY
- MONITOR
- MAINTAIN THE FACILITY
- OPERATIONS MANUAL
- EMERGENCY ACTION PLAN
- PERIODICALLY REVIEW, TEST, UPDATE
- MAINTAIN COMPLETE SETS OF RECORDS

# BREACH OF DUTY

DEFENDANT MUST HAVE BREACHED THE DUTY OWED PLAINTIFF

CAN BE ESTABLISHED THROUGH

- EXPERT TESTIMONY
- CIRCUMSTANTIAL EVIDENCE
- COMMON SENSE
- LEGAL THEORY: RES IPSA LOQUITER (“THE THING SPEAKS FOR ITSELF”)
- **TYPE OF ACCIDENT THAT NORMALLY WOULD NOT HAVE OCCURRED IN ABSENCE OF NEGLIGENCE**
- **INSTRUMENTALITY WAS IN EXCLUSIVE CONTROL OF DEFENDANT**

# Causation

Plaintiff's burden of proof:

To prove by a preponderance of the evidence that it is more likely than not that Defendant's act was **a** cause of Plaintiff's injury – not **the** cause.

# **OPERATIONS DURING A FLOOD**

**GENERAL RULE: CAN PASS  
THROUGH THAT WHICH IS COMING  
IN, BUT NO MORE**

Even if the tragedy was caused by an unforeseeable or uncontrollable act of nature, liability may still result if human acts of negligence coalesce with nature to cause damage.

Liability may still result if human acts of negligence coalesce with negligent or intentional acts of third party.

Examples:

- Owners and occupiers of land for inadequate security
- Negligence of public authorities in responding to 911 emergency calls
- Inspectors
- Products liability: “second crash”

Joint and several liability  
may effectively result in  
100% liability for any one  
party/cause.



Large disasters normally have  
many causes.

# Multiple causes/factors for the Katrina disaster

- Hurricane and storm surge
- Construction in vulnerable areas
- Design limits of levee system
- Construction defects (?)
- Maintenance
- Natural settlement of levees/maintenance questions
- Leadership problems
- Failure to follow emergency action plan

Levee = dam without an emergency  
spillway

Lack of a plan

# High Timber Times

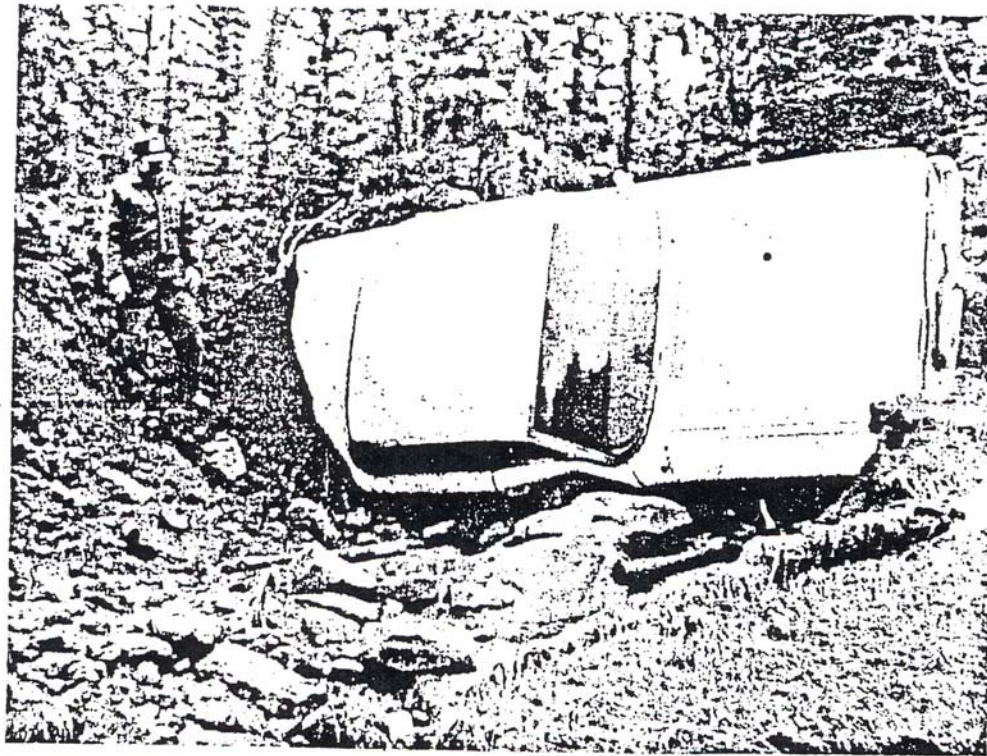
VOLUME 7 NO. 22

THURSDAY, JUNE 2, 1983

CONIFER COLO.

25 CENTS U.S.P.S. 387-850

## Car saves dam, stops flood



A car was pushed into the hole of a breached dam above Shaffers Crossing Saturday ending a "life threatening" flood situation. -Photo by Joni Isman



# *Dozers Lost*



AFTER VAINLY TRYING TO FILL BREACH  
IN EMBANKMENT OF TETON DAM,  
"CAT" OPERATORS BACK TOWARD  
SAFETY AS THEIR BULLDOZERS SLID  
INTO THE WIDENING GAP

The presence of a viable emergency action plan, which has been periodically tested and updated, may well reduce the threat to the downstream population, even if the dam cannot be saved.



# Requirements for an emergency action plan may be found in:

- Statutes
- Regulations
- Agency guidelines
- Professional standards
- Common law

# Three Factors

- The risk of an incident occurring
- The potential magnitude should the risk materialize
- The burden of adequate precautions

# Risk

- Low --  
but not non-existent.
- No human activity has  
zero risk.

# Potential Injuries/Damages/Losses from a Failure

- Loss of life
- Personal injuries
- Emotional distress/post-traumatic stress syndrome
- Disaster relief
- Revenue losses
- Loss of use of facility
- Business interruption
- Decline in productivity
- Health and sanitation
- Repair & reconstruction costs
- Clean-up & recovery costs
- Employment losses
- Workers compensation
- Environmental damages
- Natural resources
- Fish, wildlife & vegetation
- Farms, homes, commercial, industrial, government structures destroyed
- Infrastructure losses
- Cultural resources
- Utility services
- Political
- Loss to beneficial users of the facility
  - Water supply
  - Irrigation
  - Recreational users
  - Hydroelectric
- Crime
- Fraud and corruption
- Insurance
- Taxation

# Buffalo Creek

February 26, 1972

- 125 lives lost
- 1100 injured
- Destroyed over 500 homes
- Destroyed over 40 mobile homes
- 16 communities wiped out
- 4000 of 5000 inhabitants left homeless
- Roughly \$50 million in damages
- No warnings until after the structure failed, but employees knew something was wrong
- Four false alarms in past
- No emergency action plan

# **Teton Dam**

June 5, 1976

- 11-14 lives lost
- 25,000 homeless
- 300 square miles inundated
- \$400 million compensation
- Failed on initial filling
- Multiple errors of omission and commission
- Failure to learn from similar errors 11 years earlier
- Sent two bulldozers into the breach
- Warnings issued, and most of the impacted population successfully evacuated
- No emergency action plan

# Lawn Lake Dam

July 15, 1982

- High in Rockies overlooking resort community of Estes Park
- Dam was privately owned, but on National Park Service land
- Failed before 6:30 a.m. Flood wave destroyed lower Cascade Dam.
- Then flooded the camp ground
- Then roared through Estes Park
- Three deaths
- Over \$31 million in property damage
- No emergency action plan by dam owner
- No contingency plan by National Park Service
- Warnings of failure to Park Service
- One ranger casually warned several, but not all, campers. No sense of urgency in warnings.
- Government liable to one deceased camper for \$480,000

**United States v. Coates, 612 F.Supp. 592 (C.D.  
Ill. 1985)**

- “[T]he Government . . . also creates a duty for itself to develop orderly procedures for dealing with emergencies. It is imperative to have a plan in place because in such situations there is little time for reflection. Priorities should be established before an emergency arises; otherwise personnel are unprepared to deal with them.”
- “Elementary lapses, obvious with the clarity of hindsight, could have been avoided through the development of orderly procedures for warning and evacuating people in the park in the event a crisis arose. There was a duty to plan. The Government failed to develop a plan, and the Court here finds that the failure to have a plan in place was a proximate cause of the death of Terry Coates.”
- “The exercise of reasonable care mandated, at a minimum, the issuance of careful and complete warnings to all of the people who were camped in or otherwise using areas of the park which were downstream from Lawn Lake Dam.”



# **Lessons from Lawn Lake Dam,**

- Have emergency action plan prepared.
- Convey the appropriate sense of urgency.

# **Liability**

Liability will exist for those losses/damages which could have been averted or minimized through the preparation and implementation of a viable emergency action plan.

# **Safety Measures**

(Emergency Action Plans)

- Relatively inexpensive
- Sample plans available
  - FEMA
  - Several states
- Ease of preparation
- Warnings save lives

# Emergency Action Plans

- Possible failure modes should be identified.
- Inundation maps, warning and evacuation plans should be prepared for downstream areas at risk or quarantine/isolation plans for pestilence.
- ***The EAP is a dynamic document and process to be periodically reviewed, tested, revised, and updated.***
- Critical personnel and telephone numbers should be kept up to date.
- Redundancy (computer, back-ups, auxiliary generators)
- Simplicity
- Training and education: Do not limit knowledge and operations of plan to one or two critical individuals or computers.
- Will vary by stages, e.g. construction, operations
- Communications, transportation, access
- Complacency is your enemy.

ORANGE COUNTY EDITION

# Los Angeles Times

On The Internet: [WWW.LATIMES.COM](http://WWW.LATIMES.COM)

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**DEVASTATION:** Freight cars and lumber litter a neighborhood in Commerce after a fast-moving runaway train was derailed without warning by railroad officials.

CARLOS CHAVEZ Los Angeles Times

# Training and practice may:

- Discover strengths and weaknesses, including personnel
- Facilitate implementation of emergency action plan in real emergency
- Minimize the risk of false alarms

# **Keys to a Successful Emergency Action Plan**

- **Simplicity**
- **Redundancy**
- **Training**
- **Discipline**

# Failure to Follow the Plan

- Ignorance
- Inadequate training
- Complacency
  - Exxon Valdez (March 24, 1989)
    - EIS for Alaskan Pipeline predicted an average of one major spill a year.
    - **None** before Exxon Valdez
    - **None** afterward
  - But Exxon Valdez
    - Grounding was a disaster
      - But Aleyska unprepared for the disaster
    - Complacency
      - Equipment broken, run-down and temporarily removed from the storage barge
      - Response team disbanded in 1981

OR

- Doesn't fully apply – better to vary from plan

***Burden of proof should be on the operator to justify the deviation.***



# Ineffectiveness of Plan

Not 100% effective

Why?

Negligence if

- Failure to test plan
  - E.g., sirens don't work
- Failure to keep it up to date
  - People retire, move, reassign
  - Phone numbers change
  - Don't have weekend, vacation contact numbers
  - Population, developmental changes
  - Changes in technology
- Inadequate training

***Don't leave it on the shelf gathering dust.***

# On the Other Hand

- Engineering is not an exact science.
  - It's an art – not a science.
- I would argue
  - So too are emergency action plans
  - Not intended to be an insurer or guarantor
  - Probably no plan is 100% effective.
- Subject to change
  - Developmental changes
  - Technological advances

*Need to incorporate technological advances from elsewhere.*

*(Lawyers will argue that it's negligence not to learn from lessons/mistakes elsewhere.)*

# Continuing Problem: Response Level

- Under response
- Over response
  - E.g. SARS
    - China – Initially under responded/covered up
    - Toronto – Complained of over response (warnings not to travel to Toronto)
- No definite resolution
- But guidelines (“triggering” steps may define level of response)

# DAMAGES

- LOSS OF LIFE
- PERSONAL INJURY
- EMOTIONAL DISTRESS
- PROPERTY DAMAGES
  - DIMINUTION IN VALUE
  - RESTORATION
  - REPLACEMENT

# DEFENSES

## ACT OF GOD

- EVENTUALITY OUTSIDE OF HUMAN CONTEMPLATION, UNACCOMPANIED BY HUMAN ACTS OF NEGLIGENCE
- IF A SIMILAR STORM OCCURRED BEFORE, OR IS FORESEEABLE, THE DEFENSE FAILS
- DEFENSE IS GENERALLY LIMITED TO TRULY UNFORESEEABLE EVENTS

# Conclusion

Whether disaster is of natural or human origin, or a combination of both, the keys to minimizing the impacts are:

Prevention

Preparedness

Response

**PLAN AHEAD**

**D**